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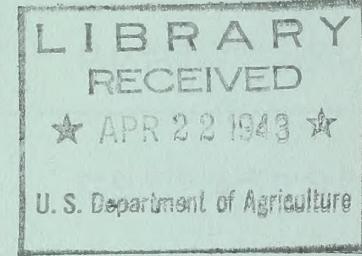
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SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for the
COLORADO RIVER DRAINAGE BASIN

April 1, 1943

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INTERVIEW WITH ALEXANDER GOLIKOV

2400 J. M. T. Thompson

ANSWER: (P) PRACTICAL

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

COLORADO RIVER BASIN
April 1, 1943

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service, U. S. Department of Agriculture, in cooperation with State departments, other federal bureaus and local organizations. The snow measurements are made principally by field personnel of the following Federal Government organizations: Forest Service, National Park Service, Geological Survey, Bureau of Reclamation, Indian Service; and the Utah Agricultural Experiment Station. This work is otherwise conducted cooperatively with the State Engineers of Utah and Colorado, State Planning Board of Wyoming, U. S. Geological Survey, Utah and Colorado Agricultural Experiment Stations, and various municipalities, irrigation associations, power companies, and others. Precipitation records are supplied by the U. S. Weather Bureau.

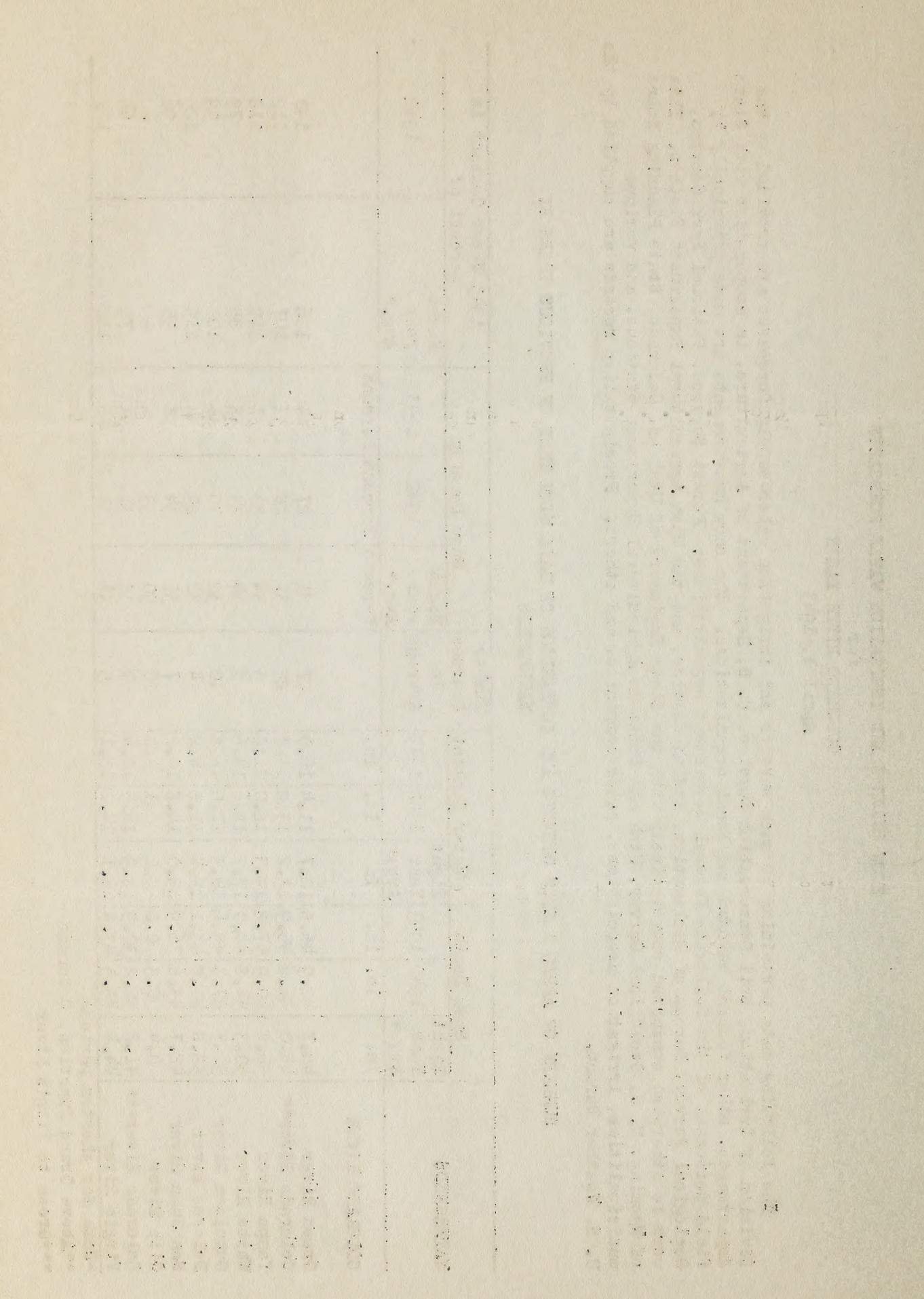
SUMMARY OF APRIL 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth				Water Content			Courses in Average Year Avg.*	Snow Density	1943 Water Content in percent of		
	Eight Year Avg.*		1942		1943		1942			1943		1942
	In.	In.	In.	In.	In.	In.	Percent	Percent	Percent	Percent	Percent	
COLORADO RIVER												
Green River	40.7	42.9	46.5	12.7	11.4	16.0	27	31	27	34	126	140
Colorado River**	45.0	46.6	45.9	13.8	13.2	14.8	22	31	28	32	107	112
Yampa River	56.8	60.9	57.9	19.3	18.0	21.2	5	34	30	37	110	118
White River	50.3	54.8	44.0	17.2	18.6	14.6	2	34	34	33	85	79
Gunnison River	51.3	57.3	49.6	16.5	17.0	16.8	10	32	30	34	102	99
Dolores River	38.8	40.8	43.1	12.4	11.8	14.8	4	32	29	34	119	125
San Juan River	42.7	43.6	36.9	15.0	14.8	14.2	7	35	34	38	95	96
Gila River	0.4	0.3	0.0	0.2	0.1	0.0	10	50	33	-	-	-
Colorado River***	41.8	52.2	30.9	13.9	16.3	10.4	7	33	31	34	75	64
Virgin River	44.4	45.5	43.3	16.1	14.2	18.1	5	36	31	42	112	127

*Some for shorter periods

**Above Grand Junction, Colorado

***Green to Virgin River



PRECIPITATION DATA

WATERSHED	STATE	Precipitation October 1 to		Departure from Normal		Precipitation		Departure from Normal	
		March 31	Inches	March	Inches	March	Inches	March	Inches
Colorado	Colorado	5.45		•0.30		1.16		-0.05	
Green	Wyoming	7.93		+3.24		0.96		+0.27	
San Juan	New Mexico	4.29		-0.80		1.19		+0.29	
Gila	Arizona	4.36*		-0.62*		2.18*		+1.48*	
Gila	New Mexico	4.16		-0.99		0.78		-0.02	

*Based on incomplete returns.

In Colorado on the watersheds of the Colorado River and its tributaries the March precipitation was practically normal and from October first last year to date the accumulation was one-third of an inch in excess of the normal. For the Green, in western Wyoming, the March precipitation was one-quarter inch above normal and since last October the excess was $3\frac{1}{4}$ inches. During March, over the San Juan and Gila watersheds, the precipitation was above normal except the Gila in New Mexico. Since October the rainfall has been below the average for these areas.

WATER SUPPLY OUTLOOK

COLORADO RIVER AND TRIBUTARIES IN COLORADO. The water content of the snow on the headwaters of these streams averages about 10 percent more than last year at this time and the outlook is quite favorable for a normal run-off. For the Colorado, above Grand Junction, the snow contains about 12 percent more water than a year ago and the expected flow of the river at Glenwood Springs, April-July 1943, will be 1,500,000 acre-feet. For this same period the Roaring Fork will discharge 560,000. On the headwaters of the Colorado, Grand Lake area, the water content exceeds last year by about 25 percent. At Lake Irene on the Trail Ridge Road the snow contains 23 inches of water. On the west side of Loveland Pass the water content is 24 inches, Shrine Pass 22. The outlook for the Blue River drainage is especially good at this time and the run-off will be more than sufficient to fill the Green Mountain Reservoir now nearing completion.

For the Gunnison the run-off will approximate that of last year. The snow on Grand Mesa is less than a year ago by about 20 percent, however at Trickle Divide the snow now contains 25 inches of water. At Crested Butte and Marshall Pass the water content exceeds that of a year ago by 20 and 25 percent respectively. Reservoir filling has been normal during March throughout western Colorado. Taylor Park Reservoir, Gunnison

drainage, will no doubt fill to capacity. Fruit Grower's Reservoir near Cedaredge is now spilling and a number of the small reservoirs and lakes on Grande Mesa will fill. In the Uncompahgre Valley stream flow is normal and soil moisture fair to good. However, March precipitation was subnormal.

On the Yampa watershed the water content of the snow exceeds last year by about 20 percent. At Columbine Lodge, Rabbit Ears Pass, there is 27 inches of water in the snow as compared with 21 inches a year ago. There will be a better-than-average run-off in the Yampa River this season with ample water for all irrigation needs. Small storage reservoirs will be filled. During March the precipitation has been normal, soil moisture good, range conditions good, and stream flow normal over this drainage.

The snow cover on the headwaters of the White is only about 3/4 of that a year ago and the run-off this season will be below normal. April storms can materially change the present outlook. During March, near Trapper's Lake, the water content of the snow was increased by 2 inches.

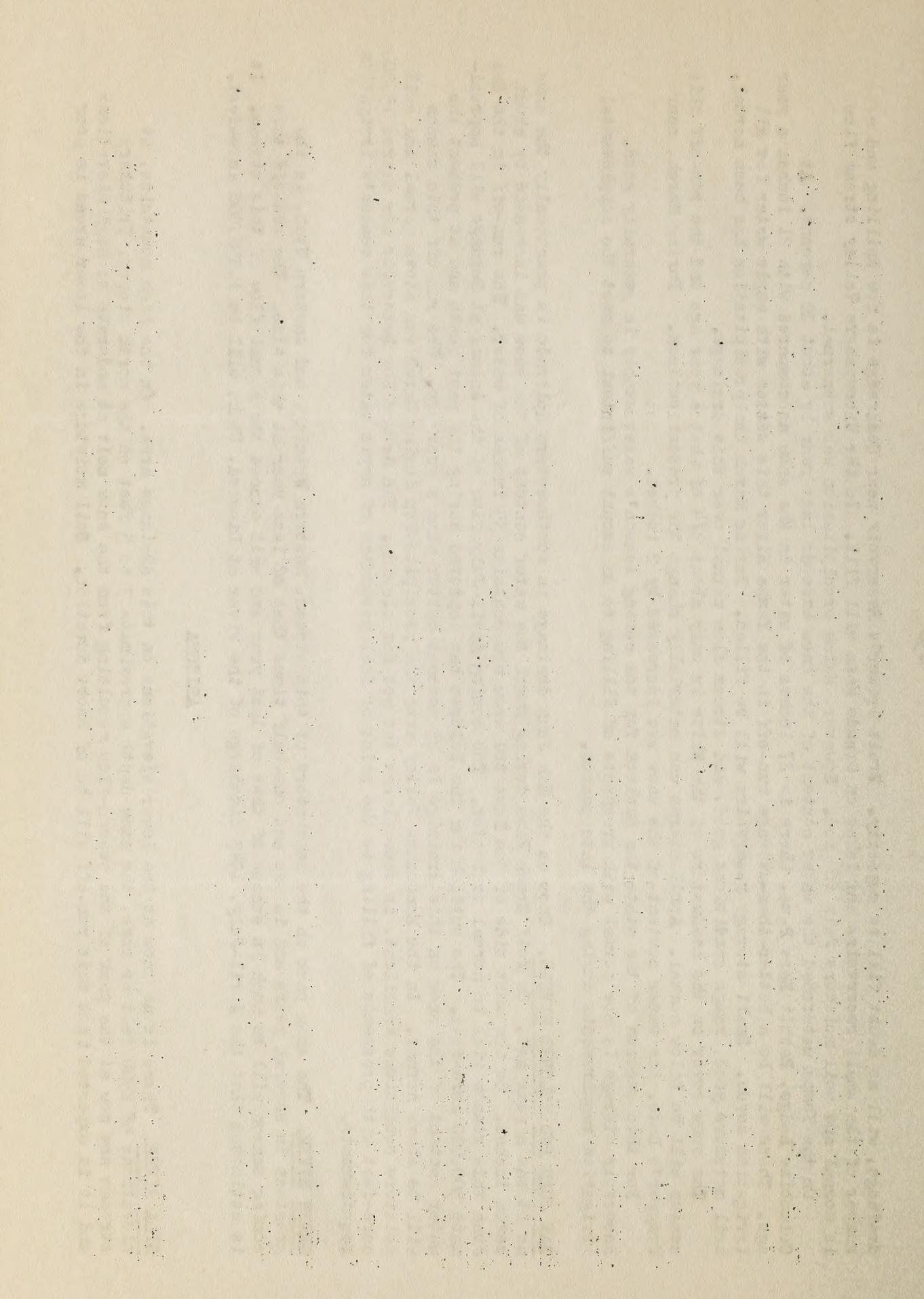
For this section of the state the outlook for the coming season's water supply is generally good. Reservoir storage is now normal with prospects of filling to an amount sufficient to meet the supplemental irrigation requirements during the late season.

SAN JUAN AND DOLORES RIVERS. Snow on the San Juan drainage in southwestern Colorado is practically the same as it was a year ago. On Wolf Creek Pass during March the water content of the snow was increased by about seven inches. On the west side of the Pass the snow now contains 35 inches of water. The run-off in the San Juan this season will be normal or better. The coming April-July flow of the Animas at Durango will approximate 500,000 acre-feet. The outlook for the Dolores has improved during the past month and at present the water content of the snow on this drainage is 25 percent better than a year ago. The run-off this season will be above normal. In the Montezuma Valley area the precipitation during March was above normal and soil moisture conditions excellent, in some places too wet for plowing. The Ground Hog Reservoir now stores 15,000 acre-feet with prospects of filling to the point of full assurance of ample water for this season's irrigation requirements.

GREEN RIVER. The snow pack on the headwaters of this stream, western Wyoming, and eastern Utah, is the greatest in several years and is one and one-half times that of last year at this time. The run-off this coming season will be much in excess of that of last year and will exceed the normal flow of this stream. It is estimated that the April-July, 1943 discharge of the river at Linwood, Utah, will be 1,350,000 acre-feet.

ARIZONA

GILA RIVER. There is no snow at the lower elevations on this drainage area. On the high mountains, at elevations of 8500 feet or more, the snow depth approximate 3 to 5 feet on the north slopes. Tributary streams are now at the peak of the season-flow resulting from the snow melt at moderate to high elevations and it is expected that this run-off will be of short duration. Soil moisture in the lower areas is poor



to fair, at higher elevations fair to good, and range conditions just fair. San Carlos Reservoir, on the Gila, reached maximum filling of 564,000 acre-feet on March 17. Accumulation for March was about 35,000 acre-feet.

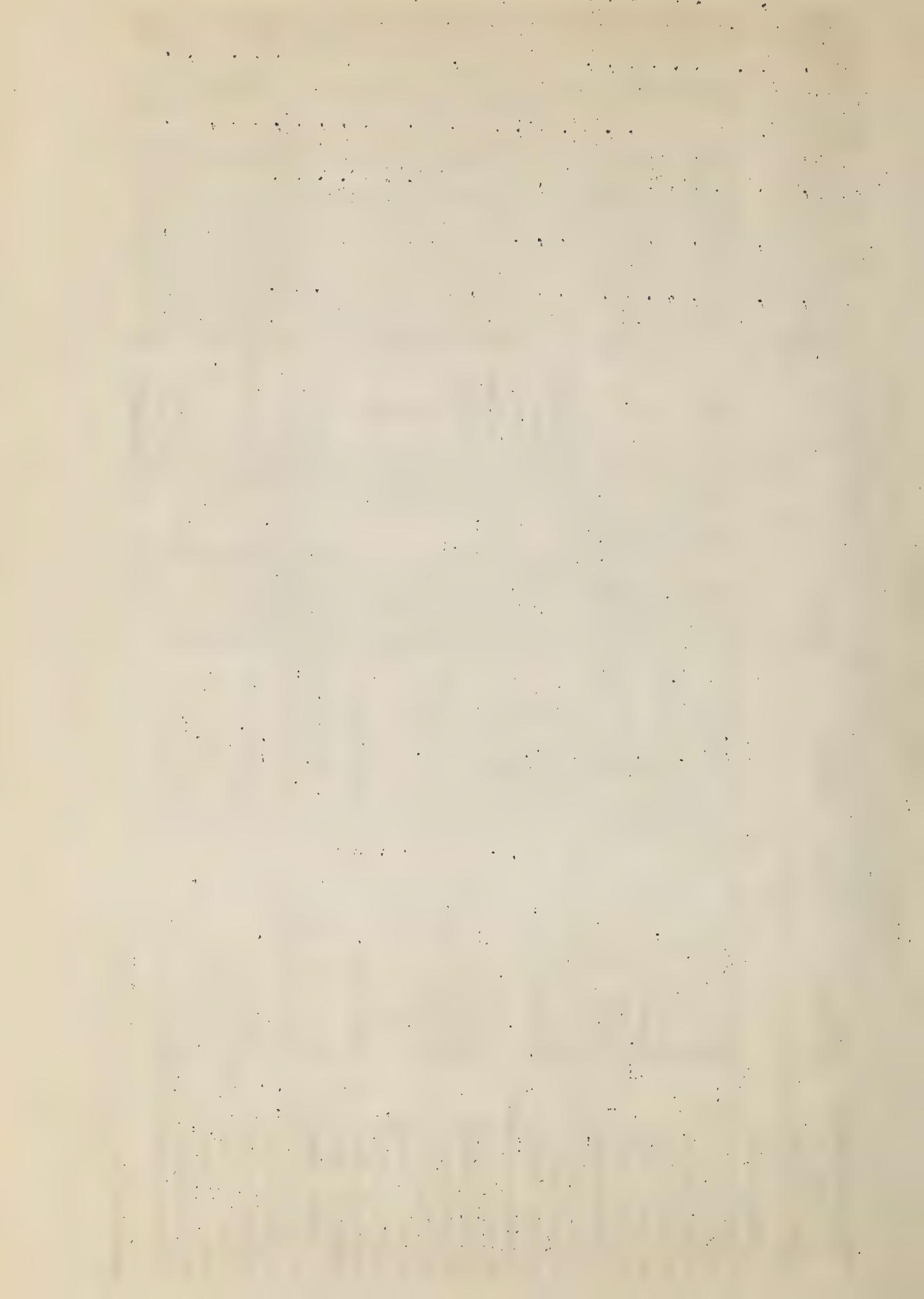
SALT RIVER AND TRIBUTARIES. The present snow cover on the headwaters of these streams is confined to the higher elevations, above 9000 feet. On the north slopes the depths are estimated to vary from 3 to 5 feet. Soil moisture in the higher country is poor to fair and stream flow below normal. Range is dry. Run-off from snow cover will be light. However, at this time the combined flow of the Salt, Tonto and Verde rivers is about 20 percent above normal. The combined reservoir storage on the Salt, March 30th, was 1,566,000 acre-feet or about 95 percent of that of a year ago. The Carl Pleasant Reservoir on the Agua Fria stores about 5000 acre-feet. In the Prescott National Forest the March precipitation was subnormal, soil moisture fair and range conditions fair. The Agua Fria and its tributaries are below normal. Mountains are bare of snow except north slopes. Snow cover is estimated at 10 percent of average as of April first.

VIRGIN RIVER. The snow pack on the Virgin River watershed is greater than last year by 27 percent and exceeds the 8-year average by 12 percent. Runoff is expected to be slightly better than normal.

COLORADO RIVER WATERSHED
 Summary of Federal and State Cooperative Snow Surveys
 Issued April 10, 1943, at Fort Collins, Colorado

Main Drainage and Snow Course No.	Local Drainage	Local Locality	State	Location	Descrip- tion	Apr. 1 Snow Cover Measurements						
						Elev. Forest		National		Av. Snow Depth		Av. Water Content
						In.	In.	In.	In.	Av. @ 1942	1943	
GREEN RIVER												
44 East Rim Divide	Fish Creek	13 mi. SE. Bondurant	Wyo.	32-37N-111W	7950 Teton	39.9	32.1	54.2	12.3	7.9	18.1	
23 Dutch Joe R. S.	Dutch Joe Cr.	12 mi. N. Elkhorn	"	33-31N-104W	8700 Wyoming	30.6	32.8	41.2	8.0	6.2	11.9	
24 Mulligan Park	Surveyor Cr.	Fremont Lake	"	17-35N-108W	8900 "	37.2	32.2	46.8	10.4	8.6	15.9	
25 Kendall R. S.	Green River	"	"	23-38N-110W	7900 "	33.3	24.9	53.3	11.9	8.1	21.3	
26 Loomis Park	Beaver Cr.	25 mi. NW.	"	14-37N-111W	8500 "	48.2	37.6	68.0	16.2	9.0	27.4	
27 Snyder Basin R. S.	S.Piney Cr.	22 mi. W. Big Piney	"	15-29N-114W	8040 "	37.8	33.9	63.3	11.6	9.1	23.4	
28 Piney-LaBarge	LaBarge Cr.	24 mi. W. Big Piney	"	19-29N-114W	8820 "	49.2	46.6	71.8	16.3	12.9	29.7	
23 Daniels-Strawberry	Strawberry R.	Utah	"	17&20-25-12W	8000 Uinta	43.8	43.0	50.8	14.9	13.4	18.2	
28 Lost Lake	Provo River	18 mi. E. Kamas	"	4&5-2S-9E	9900 Wasatch	69.8	65.7	91.2	24.9	21.6	34.7	
33 East Portal	Strawberry L.	25 mi. E. Provo	"	36-7S-6E	7600 Uinta	37.7	39.6	42.4	13.0	11.8	14.1	
33AE Port. Strawberry	D.	24 mi. E. Provo	"	34&35-7S-6E	8000 "	60.3	56.1	68.0	21.3	18.1	23.2	
34 Hewinta R. S.	West Fork	33 mi. SE. Evanston	"	33-37N-11E	9500 Wasatch	34.2	41.2	38.5	9.1	10.7	12.9	
35 Hole-In-Rock	Beaver Cr.	47 mi. SE.	"	13-2N-15E	9150 Ashley	24.7	35.7	27.5	5.5	5.8	6.1	
36 Lake Fork Mtn.	Yellowstone Cr.	4 mi. E. Moon Lake	"	2&3-2N-5W	10500 "	45.1	56.5	50.3	9.9	11.4	12.8	
37 Paradise Park	Whiterocks R.	25 mi. NW. Vernal	"	7-3N-1E	10500 "	42.6	52.3	45.4	11.0	11.7	14.8	
38 Mosby Mtn. #1	"	22 mi. " "	"	5-2N-1E	9700 "	37.2	42.6	42.9	9.8	8.5	13.9	
38 Mosby Mtn. #2	"	" "	"	5-2N-1E	9500 "	34.8	48.4	42.9	8.8	8.7	13.9	
39 King's Cabin #1	Brush Creek	18 mi. N. Vernal	"	22-1S-21E	8800 "	35.0	35.7	31.6	9.0	7.1	10.9	
39 King's Cabin #2	"	" "	"	23&26-1S-21E	8600 "	31.5	32.3	31.6	8.5	7.1	10.9	
40 Indian Canyon	Strawberry R.	27 mi. SW. Duchesne	"	2-11S-10E	9100 Uinta	36.0	42.2	35.9	9.1	9.2	10.6	
41 Gooseberry Res.	Gooseberry Cr.	7 mi. NE. Fairview	"	25-11S-5E	8700 Manti	58.9	63.0	50.8	21.5	20.3	16.8	
42 Mammoth R. S.	"	" "	"	13&23-13S-5E	8800 "	63.0	64.7	52.9	23.0	22.1	19.5	
42A Stahley Ranch	Clear Cr.	1 mi. N. Scofield	"	32-12S-7E	Off Forest	16.6	24.3	24.0	4.9	5.3	6.5	
42B Dry Valley Divide	Fish Creek	7 mi. NE.	"	"	"	27.8	34.1	31.5	8.2	8.3	9.0	
42C Clear Creek	Clear Creek	1 mi. N. Clear Cr.	"	28-13S-7E	8150 "	19.2	25.2	24.5	6.8	6.8	9.7	
43 Entngtn-Horseshoe	Huntington Cr.	7 mi. E. Fairview	"	12&13-14S-5E	9800 Manti	76.1	80.4	64.2	27.4	22.1	22.7	
53 Widtsoe Escalante	E. Escalante	6 mi. E. Widtsoe	"	22-34S-1W	9500 Powell	28.8	35.3	11.3	9.5	12.2	3.3	
Average for Drainage						40.7	42.9	46.5	12.7	11.4	16.0	

Average for period of record.

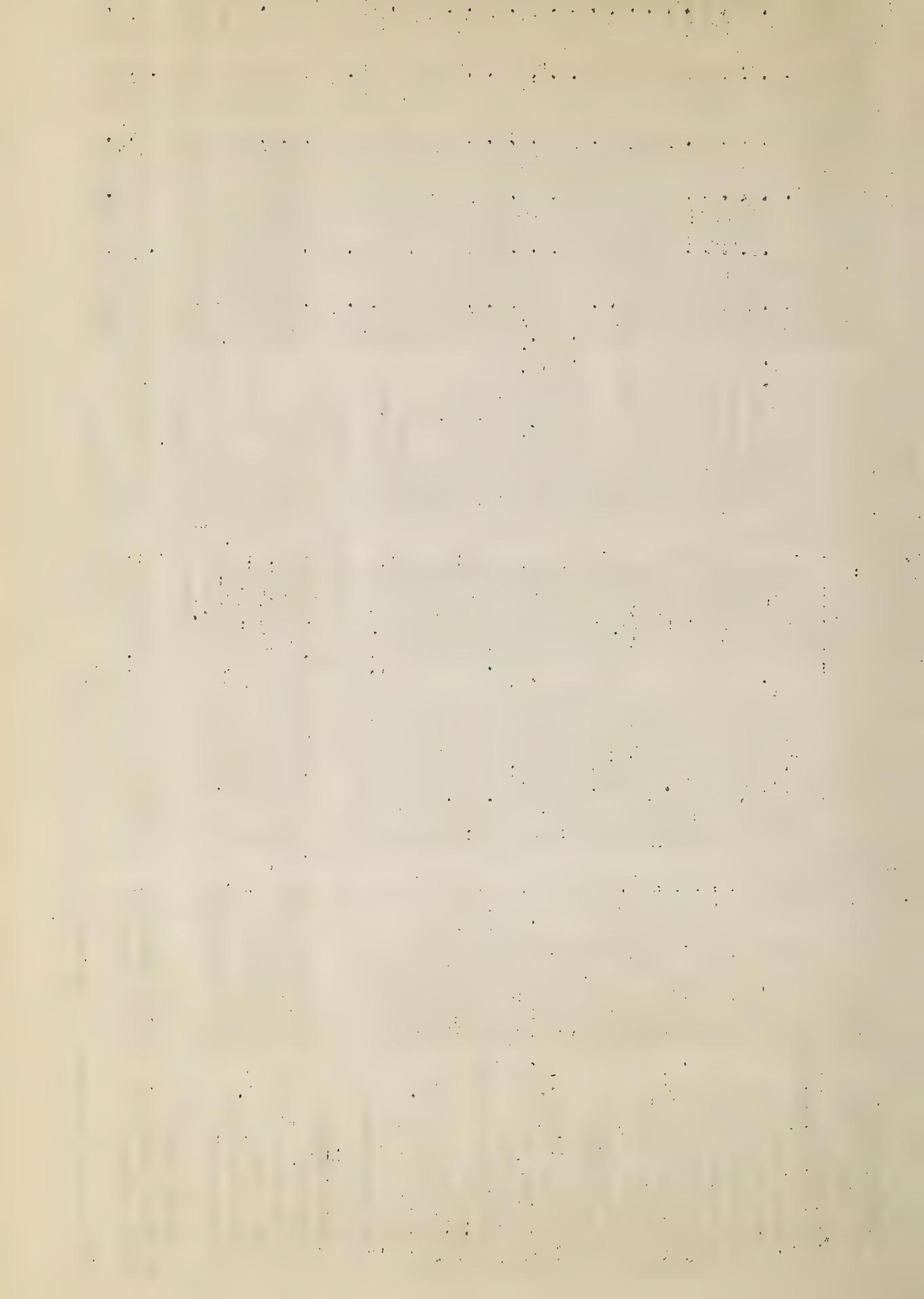


COLORADO RIVER WATERSHED

Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1943, at Fort Collins, Colo.

*On adjacent drainage

@Average for period of record



COLORADO RIVER WATERSHED

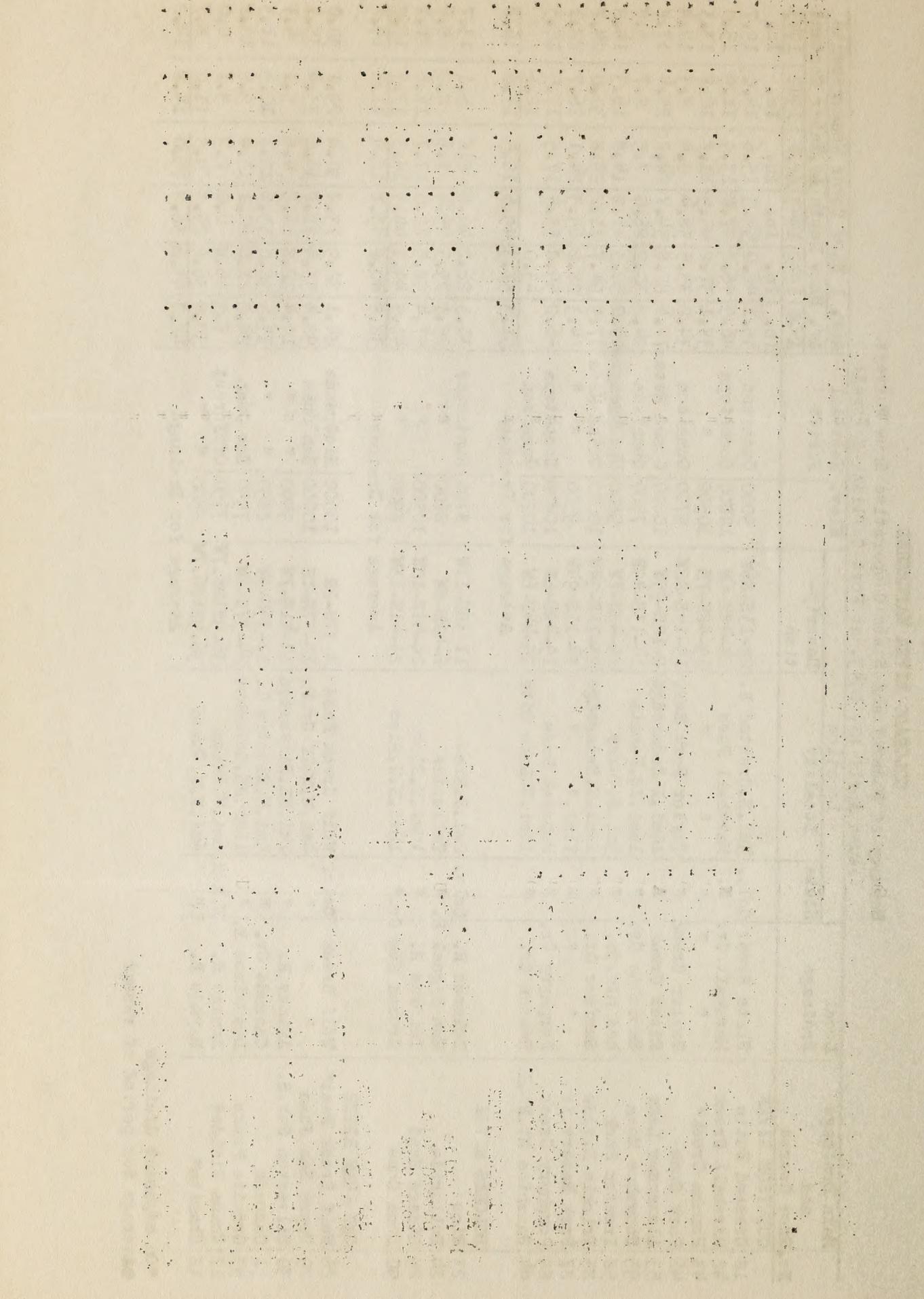
Summary of Federal and State Cooperative Snow Surveys

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Main Drainage and Snow Course	Local Drainage	Location	State Locality	Description	Apr. 1 Snow Cover Measurements						
					Av. Elev.	National Forest	Av. Snow Depth	Av. Water Content	1942	1943	
No.	Course	State	Locality	1942	1943	Av. @	1942	1943	Av. @	1942	1943
GUNNISON RIVER											
18 Crested Butte	Slate River	Colo.	3mi. N. Crested B.	22-13S-86W	9000	Gunnison	45.1	46.0	15.6	14.0	19.7
42 Marshall Creek	Marshall Cr.	"	Marshall Pass	24-48N-6E	10800	Cochetopa	46.9	46.2	47.8	13.9	15.0
43 Poncha Creek*	"	"	"	19-48N-7E	10500	"	38.1	37.2	40.9	11.8	13.3
46 Park Cone	Taylor Creek	"	Taylor Park Res.	19-14S-82W	9700	Gunnison	34.2	35.5	38.4	9.4	12.4
53 Alexander Lake	Kiser Creek	"	10mi. N. Cedaredge	2-12S-95W	10000	Grand Mesa	72.4	82.8	54.7	24.2	25.4
55 Snowshoe Mesa	Snowshoe Cr.	"	16mi. N.E. Paonia	14-13S-89W	7500	Gunnison	24.2	30.2	26.0	7.5	17.8
58 Ironton Park	Red Mtn. Cr.	"	5mi. S. Ouray	29-43N-7W	9800	Uncompahgre	44.0	52.3	41.9	14.8	9.8
85 Trikle Divide	Surface Cr.	"	13mi. N. Cedaredge	23-11S-94W	10000	Grand Mesa	77.9	94.7	71.2	25.8	14.8
87 Park Reservoir	"	"	11mi. " "	34-11S-94W	9500	"	74.3	88.2	65.3	24.1	24.8
89 Porphyry Creek	Monarch Pass	"	19-49N-6E	10800	Cochetopa	56.2	59.8	55.5	17.5	22.1	18.5
94 Sunshine Mt. No.2	Lake City	"	10mi. W. Lake City	35-44N-6W	10200	Gunnison	43.0	51.3	49.6	12.6	17.0
DOLORES RIVER				Average for Drainage	51.3	57.3	49.6	16.5	17.0	16.8	
23 Rico	Dolores R.	Colo.	2mi. S. Rico	11-38N-11W	8700	Montezuma	30.5	26.2	40.8	8.8	5.1
24 Telluride	San Miguel R.	"	Telluride	6-42N-8W	8600	"	25.3	29.3	25.4	7.6	8.6
25 Lizard Head	Dolores R.	"	10mi. N. Rico	24-41N-10W	10300	"	57.4	58.5	62.0	17.7	21.1
90 Lone Cone	Ground Hog Cr.	"	16mi. N.W. Rico	23-41N-13W	8900	"	41.9	49.1	44.3	15.3	15.8
SAN JUAN RIVER				Average for Drainage	38.8	40.8	43.1	12.4	11.8	14.8	
26 Wolf Creek Pass*	Wolf Creek	Colo.	4-37N-2E	10000	Rio Grande	84.1	82.9	73.8	30.4	29.1	30.0
29 Upper San Juan	"	"	10-37N-1E	10000	San Juan	98.4	93.4	88.8	34.6	33.4	35.1
30 Silverton Sub. S.	Animas R.	"	10-41N-7W	9400	"	19.4	22.8	16.6	4.6	5.1	4.3
31 Cascade	Cascade Cr.	"	12-39N-9W	8850	"	33.5	32.0	33.6	10.8	10.3	11.3
93 Granite Peaks	Los Finos R.	"	24-37N-6W	7950	San Juan	24.2	21.0	20.1	11.9	9.6	10.2
17 Chama Divide*	Arzago R.	N. Mex.	36.9N106.7W	7750	Off Forest	8.3	16.8	0.0	2.9	5.1	0.0
18 Chamaita*	Navajo R.	"	36.9N106.7W	8500	"	30.9	36.6	25.3	9.8	11.0	8.7
			Average for Drainage	42.7	43.6	36.9	15.0	14.8	14.2		

*On adjacent drainage

@Average for period of record



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Main Drainage and Snow Course No.	Local Drainage	State	Locality	Location	Descrip- tion	Elev.	National		Apr. 1 Snow		Cover Measurements		
							Forest		Av. @ 1943	Av. @ 1942	Av. Water Content	Av. Water Content	
							In.	In.	In.	In.	In.	In.	
11	GILA RIVER		Blue River	N. Mex. 6mi. S. Luna	31-6S-20W	8000	Apache	0.9	2.7	0.0	0.3	1.0	0.0
14	Frisco Divide	"	"	Alpine; Luna	6-6S-21W	8000	"	0.6	0.0	0.0	0.2	0.0	0.0
14	State Line	"	Taylor Creek	2mi. N.E. Inmans	20-10S-10W	7850	Gila	0.0	0.0	0.0	0.0	0.0	0.0
22	Taylor Creek	"	San Fran. R.	5mi. SE. Nutrioso	23-6N-30E	8500	Apache	0.5	0.0	0.0	0.2	0.0	0.0
3	Nutrioso	Ariz.	Castle Cr.	11mi. SW. Alpine	13-4N-30E	8000	"	1.0	0.0	0.0	0.5	0.0	0.0
4	Beaver Head	"	Coleman Cr.	4mi. S.	26-5N-30E	8000	"	1.5	0.0	0.0	0.6	0.0	0.0
5	Coronado Trail	"	Salt River	3mi. NW. McNary	14-8N-23E	7200	W.M. Ind. R.	0.0	0.0	0.0	0.0	0.0	0.0
6	McNary	"	"	5mi. SW. Showlow	2-9N-21E	6000	"	0.0	0.0	0.0	0.0	0.0	0.0
7	Forest Dale	"	"	5-7N-24E	6400	"	"	0.0	0.0	0.0	0.0	0.0	0.0
8	Trout Creek	"	"	28-8N-23E	7000	"	"	0.0	0.0	0.0	0.0	0.0	0.0
9	Milk Ranch	"	"	Average for Drainage	0.4	0.3	0.0	0.0	0.2	0.1	0.0	0.0	
47	COLORADO (Green to Virgin Rivers)	Utah	Seeley Creek	8mi. SE. Ephraim	26-17S-4E	10200	Manti	76.3	47.1	22.5	25.2	16.4	16.4
48	G.B.E.S. Alpine*	"	"	2mi. " "	25-17S-4E	10000	"	78.7	39.9	21.4	25.8	14.0	14.0
48	Seeley Cr. R.S. #1	"	"	2mi. SW. Fish Lake	35-26S-1E	10000	Fish Lake	61.1	39.9	17.1	20.0	14.0	14.0
51	Fish Lake	"	Fremont Cr.	36-36S-4W	8700	Bryce N. F.	34.0	13.8	6.9	6.7	4.6	4.6	
54	Bryce Canyon N.P.	Paria River	"	36-26S-24E	8000	Bryce N. F.	13.9	20.1	0.0	5.2	0.0	0.0	
64	La Sal Mountain	Mill Creek	"	36-33S-22E	8500	La Sal	32.5	48.8	34.8	9.5	15.2	10.4	
65	Buckboard Flat	Montezuma Cr.	"	9000	"	45.8	46.5	40.5	14.9	14.4	13.1	13.1	
65	VIRGIN RIVER			Average for Drainage	41.8	52.2	30.9	13.9	16.3	10.4	10.4		
56	Gravel Spgs. Jnct.	Utah	Virgin River	31mi. N. Kanab	22-38S-6W	7500	Dixie	13.9	17.9	5.6	11.0	11.0	
57	Harris Flat R.S.*	"	"	29mi. SE. Cedar	24-38S-7W	7700	"	29.0	26.5	10.7	9.1	13.3	
58	Duck Creek R.S.*	"	N.Ek. Virgin R.	22mi. " "	11-38S-8W	8560	"	50.6	48.3	17.8	17.4	18.3	
59	Cedar Breaks*	"	Virgin River	14mi. " "	13-37S-9W	10200	"	72.9	66.3	25.6	24.8	25.3	
61	Webster Flats RS*	"	"	11mi. " "	20-37S-9W	9200	"	56.0	57.5	20.8	19.6	22.5	
61				Average for Drainage	44.4	45.5	43.3	16.1	14.2	14.2	18.1		

*On adjacent drainage

@Average for period of record.

